REMARKS

Applicants have received and reviewed an Office Action dated April 16, 2007. By way of response, Applicants have amended claims 1-14, withdrawn claims 16-17, and added claims 18-25.

The amendments to claim 1 have support in the specification at least at Figures 4A, 5A, 5B, and 6 and at paragraphs [0042] and [0045]. The amendments to claims 10 and 11 are supported in the specification at least at paragraphs [0007] and [0016]. New claims 18 and 19 are supported in the specification at least at paragraphs [0040] and [0044]. New claims 20 and 21 are supported in the specification at least at paragraphs [0044] and [0045]. New claims 22 and 23 are supported in the specification at least at paragraph [0040]. New claims 24 and 25 are supported in the specification at least at paragraphs [0007] and [0040]. No new matter is presented.

Claims 1-15 and 18-25 are pending. Applicants submit that the pending claims are supported by the specification. For the reasons given below, Applicants submit that the amended and newly presented claims are in condition for allowance and notification to that effect is earnestly solicited.

1. 35 U.S.C. § 102(b)

Claims 1-9 and 13 were rejected under 35 U.S.C. § 102(b) as anticipated by Dickinson et al., U.S. Pub. No. 2002/0102578 ("Dickinson"). Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Dickinson discloses a composite sensor array. The Examiner contends the gasket of Dickinson et al. is situated in a groove of either the base plate or the lid as shown in Figure 8. The Examiner contends that the edge of the groove could serve as the spacer. However,

Dickinson does not describe a hybridization chamber as claimed by applicants. Dickinson does not describe a thermoplastic substrate that comprises a back side having at least one support ridge. The substrates of Dickinson are either sufficiently rigid that no support is necessary or the molded layer is bonded to the support.

As amended, claim 1 sets forth the requirement of Applicants' invention that the thermoplastic substrate comprises a back side having at least one support ridge. Dickinson does not disclose a thermoplastic substrate with such a support ridge. Accordingly, Applicants respectfully submit that the cited references do not anticipate the presently claimed invention of claim 1. As claims 2-9 and 13 as well as new claims 18-25 depend from claim 1, these claims are also not anticipated. Withdrawal of this rejection is respectfully requested.

Claims 1, 4-6, 8-9 and 13 were rejected under 35 USC 102(a), (e) as anticipated by Lyman et al., U.S. Patent No. 6,555,361 ("Lyman"). Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

Lyman discloses a hybridization apparatus that has a sealed chamber. However, the sealed portion of the chamber is sealed using a mechanism very similar to Dickinson et al. (U.S. Pub. No. 2002/0102578). As is shown in Figures 2 and 3, the lips of a groove 26, 28 can function as a spacer to hold a gasket, which is e.g. an o-ring 30. However, this hybridization chamber does not include a thermoplastic substrate that comprises a back side having at least one support ridge. The chamber of Lyman et al has a base plate for holding a slide and also having wells to provide for water vapor to prevent drying of the edge of the hybridization reaction. There is no disclosure in this reference of a thermoplastic backing opposite having a need for or any type of rigid support.

Applicants respectfully submit that neither Dickinson nor Lyman teach each and every element as set forth in claim 1, either expressly or inherently. Accordingly, the cited references do not anticipate the presently claimed invention of claim 1. As claims 4-6, 8-9 and 13 depend from claim 1, as do new claims 18-25, these claims are also not anticipated. Withdrawal of this rejection is respectfully requested.

2. 35 U.S.C. § 102(a), (e) or § 103(a)

Claims 1-3 were rejected under 35 USC 102(a), (e) as anticipated by Lyman et al., U.S. Patent No. 6,555,361 ("Lyman"), in view of Stanley et al., U.S. Patent No. 5,082,246 ("Stanley"). Applicants note that the Examiner has improperly combined more than one reference in making a rejection under § 102. Applicants respectfully traverse the rejection as if it were made under 35 U.S.C. § 103(a). Although the rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply.

In order to meet its burden in establishing a rejection under 35 U.S.C. § 103 the Office must first demonstrate that the combined prior art references teach or suggest all the claimed limitations. See *Pharmastem Therapeutics v. Viacell et al.*, 2007 U.S. App. LEXIS 16245 (Fed. Cir. 2007) ("the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make [every element of] the composition or device, or carry out the [entire] claimed process, and would have had a reasonable expectation of success in doing so," (citing *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007))); and see *Omegaflex, Inc. v. Parker-Hannifin Corp.*, 2007 U.S. App. LEXIS 14308 (Fed. Cir. 2007) ("[t]he Supreme Court recently explained that 'a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art,'" (citing *KSR Int'l Co.* at 1741)); and see *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006) ("[once] all claim limitations are found in a number of prior art references, the factfinder must determine '[w]hat the prior art teaches, whether it teaches away from the claimed invention, and whether it motivates a combination of teachings from different references,'" (citing *In re Fulton*, 391 F.3d 1195, 1199-1200 (Fed. Cir. 2004))).

Lyman discloses a hybridization apparatus that has sealed chamber. However, the sealed portion of the chamber is sealed using a mechanism very similar to Dickinson et al. (U.S. Pub. No. 2002/0102578). As is shown in Figures 2 and 3, the lips of a groove 26, 28 hold a gasket, which is e.g. an o-ring 30. However, this hybridization chamber does not include a thermoplastic substrate comprising a front side opposite said slide and that comprises a back side having at least one support ridge. The chamber of Lyman et al has a base plate for holding a slide

and also having wells to provide for water vapor to prevent drying of the edge of the hybridization reaction. There is no disclosure in this reference of the thermoplastic backing having a need for or any type of rigid support.

Further, Lyman requires the provision of posts 38, 40 and corresponding holes, as seen in Figures 1, 2, 4, 5, 6, 7, and 8 in order to align the clamshell type halves that define the hybridization chamber. Applicants do not require such an apparatus, or any other alignment apparatus, in amended claim 1.

Stanley does not remedy the differences between the disclosure of Lyman and Applicants' invention. Stanley discloses a rubber material that is deformable at one temperature and not deformable at another temperature. This disclosure does not provide a hybridization chamber as claimed by Applicants.

The apparatus of the claims comprises a thermoplastic backing having a back side comprising at least one rigid support and does not require post and hole combinations to ensure registration of the slide and thermoplastic substrate when they are paired to define the array hybridization chamber. In fact, Applicants require no particular means of alignment; rather, an optional arrangement comprising a holder means to align the two halves of the array hybridization chamber is set forth in new claims 18 and 19. In contrast, Lyman clearly requires a means of alignment because without it, any slight shift of alignment would cause the seal formed by the gasket to be broken.

The base plate as described by Lyman may contain one or more wells and a location where a slide can be retained. However, this reference does not teach or suggest that a thermoplastic backing requires, or can preferably have at least one rigid support so as to keep the thermoplastic backing substantially flat. The base plate of Lyman has posts that serve to align the clam shell top pieces and the base plate and cannot be located on the back side of the base plate because these posts are required to form the hybridization chamber. There is no discussion in Lyman suggesting that the posts can be on the backside of the thermoplastic substrate.

Applicants' combination of gaskets and spacers additionally provides new and unexpected advantages. As is noted above, the Applicants' invention provides a means to seal the halves of the array hybridization chamber without a strict requirement of alignment. Thus, if

the halves of the array hybridization chamber of the invention are slightly misaligned, a good seal still results. This obviates the need for additional means of alignment of the halves.

Another unexpected advantage of the present invention is that the gasket and spacer present the opportunity for many different design configurations of the array hybridization chamber. Some of these are shown in the Figures. Figure 4A shows two bar-like spacers and two rectangular gaskets that form two separated array hybridization chambers. Other similar arrangements, such as three bars and four chambers, etc. are immediately envisioned. Figure 5A shows a single gasket defining a single array hybridization chamber and two bar-like spacers. Figure 5B shows two gaskets defining two separate array hybridization chambers, and four post-like spacers. None of these arrangements are possible using the gasket-spacer combinations of the prior art.

The advantage of this flexibility of arrangement will be appreciated by one of skill in the art. There are many scenarios where it might be advantageous to define separated array hybridization chambers. For example it may be desirable to heat one array hybridization chamber but not another. It may be desirable to isolate many different experimental arrays while still providing them all on a single slide. It will also be appreciated that many different gasket and spacer arrangements can be interchanged and used together and be equally useful and effective. For example, thermoplastic substrates with various gasket arrangements can all be used with a slide having a single spacer arrangement, and vice versa. A spacer arrangement of two bar-like spacers placed at the far edges of the thermoplastic substrate can accommodate many different gaskets arrangements on a slide, such as multiple circular gaskets, multiple rectangular gaskets, a single rectangular gasket, and the like. Similarly, a single arrangement of gaskets can be spaced using a bar-like set of two spacers, four post-like spacers, and so forth. The removal of the registration requirement from the gasket-spacer combination offers a freedom of design that is not taught or suggested by any prior art reference and offers significant, unexpected, and practical advantages for the skilled artisan.

Accordingly, based on the foregoing differences, Applicants respectfully submit that the cited references neither teach nor suggest the presently claimed invention of claim 1. As claims

2 and 3 depend from claim 1, as do new claims 18-25, these claims are also not taught or suggested by the cited references. Withdrawal of this rejection is respectfully requested.

3. 35 U.S.C. § 103

The Examiner has made numerous rejections under 35 U.S.C. § 103(a). In order to meet its burden in establishing a rejection under 35 U.S.C. § 103 the Office must first demonstrate that the combined prior art references teach or suggest all the claimed limitations. See *Pharmastem Therapeutics v. Viacell et al.*, 2007 U.S. App. LEXIS 16245 (Fed. Cir. 2007) ("the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make [every element of] the composition or device, or carry out the [entire] claimed process, and would have had a reasonable expectation of success in doing so," (citing *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007))); and see *Omegaflex, Inc. v. Parker-Hannifin Corp.*, 2007 U.S. App. LEXIS 14308 (Fed. Cir. 2007) ("[t]he Supreme Court recently explained that 'a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art,'" (citing *KSR Int'l Co.* at 1741)); and see *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006) ("[once] all claim limitations are found in a number of prior art references, the factfinder must determine '[w]hat the prior art teaches, whether it teaches away from the claimed invention, and whether it motivates a combination of teachings from different references,'" (citing *In re Fulton*, 391 F.3d 1195, 1199-1200 (Fed. Cir. 2004))).

a. Dickinson in view of Dahm

Claims 1 and 10-11 were rejected under 35 U.S.C. § 103(a) over Dickinson in view of Dahm et al., U.S. Patent No. 6,399,394 ("Dahm"). Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

As is discussed above, the gasket of Dickinson is situated in a groove of either the base plate or the lid, in a similar manner to Lyman which is discussed in detail above. The arguments

under the section above entitled "35 U.S.C. § 102(a), (e) or § 103(a)" apply here with equal force to show that Applicants' invention as set forth in amended claim 1 is not obvious over Dickinson, for the same reasons it is not obvious over Lyman.

The Examiner asserts that Dahm teaches a support ridge, namely structure 30 of Figure 8, and therefore the combination of Dickinson with Dahm renders Applicants' invention obvious. However, structure 30 of Figure 8 does not resemble a support ridge as claimed by Applicants. Structure 30 is a monolithic member with additional features, such as bore holes and the like, which could not be part of Applicants' support ridges. To wit, Dahm describes the structure as a "cover member" at column 8, lines 20-29:

> "Cover member ***30*** is a substantially flat contiguous plate with a second side ***34***, and with a first side ***32*** carrying fluid ducts in the form of a first set of channels ***36*** and a second set of channels ***44***. Channels ***36*** and ***44*** have slightly enlarged outer end portions ***38, 46*** respectively, while the first set of channels ***36*** also has a hooked inner end ***40*** as illustrated. Cover member ***30*** also carries three equally spaced studs ***50*** projecting from first side ***32***, as well as six threaded bores ***52***."

This structure does not resemble Applicants' support ridges as they are shown in Figures 4A, 4B, 5A, 5B, 6, 7A, or 7B.

The combination of the cover member of Dahm with the general structure of Dickinson does not result in a structure approaching Applicants' invention. The result of combining the references would be a hybridization apparatus having a gasket situated in a groove of either the base plate or the lid, and a cover member that is a substantially flat contiguous plate having fluid ducts in the form of channels having slightly enlarged outer end portions, a hooked inner end, and three equally spaced studs projecting from first side, as well as six threaded bores.

As is discussed above, Dickinson does not render Applicants' invention as set forth in amended claim 1 obvious. The addition of the cover member of Dahm does not remedy the differences between Dickinson and Applicants' invention and does not teach or suggest any element of the apparatus described by Applicants in claim 1. Accordingly, based on the foregoing differences, Applicants respectfully submit that the cited references neither teach nor suggest the presently claimed invention of claim 1. As claims 10-11 depend from claim 1, as do

new claims 18-25, the cited references do not teach or suggest these claims. Withdrawal of this rejection is respectfully requested.

b. Lyman in view of Dahm

Claims 1 and 10-11 were rejected under 35 U.S.C. § 103(a) over Lyman in view of Dahm. Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

The nonobviousness of Applicants' invention over the disclosure of Lyman is discussed in detail above. The arguments under the section above entitled "35 U.S.C. § 102(a), (e) or § 103(a)" apply here with equal force to show that Applicants' invention is not obvious over Lyman. Dahm is also discussed above in detail. The arguments made above with regard to Dahm apply here with equal force. The arguments made above with regard to the combination of Lyman with Dahm are the same as those made with regard to Dickinson with Dahm. Accordingly, Applicants respectfully submit that the cited references neither teach nor suggest the presently claimed invention of claim 1. As claims 10-11 depend from claim 1, as do new claims 18-25, the cited references do not teach or suggest these claims. Withdrawal of this rejection is respectfully requested.

c. Dickinson in view of Mogard

Claims 1 and 12 were rejected under 35 U.S.C. § 103(a) over Dickinson in view of Mogard et al., U.S. Patent No. 6,216,905 ("Mogard"). Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

The nonobviousness of Applicants' invention over the disclosure of Dickinson is set forth in detail above. The arguments apply here with equal force to show that Applicants' invention is not obvious over Dickinson.

Mogard teaches a thermoplastic structure is a snap cap with hinge 40. The Examiner asserts that hinge 40 of Mogard discloses a fully integrated spacer, made by e.g. injection molding, on a thermoplastic structure. Applicants respectfully submit that hinge 40 is not a

spacer such as is an element of Applicants' invention, but a flexible hinge that maintains connectivity between an element and a cap for the element. The role of the hinge is to allow deformation; the deformation in turn allows the cap to be secured on the element. The function of a hinge is the opposite of the role of Applicants' spacer element. The function of the spacer in Applicants' invention is to hold two elements of the apparatus a certain distance apart and not to deform when the elements are urged together. The spacer of the invention further does not maintain connectivity between the elements as does the spacer of Mogard.

Mogard is improperly cited against the invention, because one of skill in the art of making and using array hybridization apparatuses would not reasonably look to the art of snap caps to find elements useful to an array hybridization apparatus. The art surrounding snap caps is nonanalogous to the art of a making array hybridization apparatuses. Therefore, Mogard is not properly combined with Dickinson.

Even if the references were properly combined, the combination of Dickinson with Mogard does not result in anything close to Applicants' invention. The combination would result in a hybridization apparatus having a gasket situated in a groove of either the base plate or the lid, such that the outside lip of the groove acts as a spacer, and a snap cap type cover wherein the cover is connected to the apparatus with a hinge. This is not Applicants' invention. The addition of a snap cap-type cover such as that disclosed by Mogard does not remedy the differences between Dickinson and Applicants' invention and does not teach or suggest any element of the apparatus described by Applicants in claim 1.

Accordingly, based on the foregoing differences, Applicants respectfully submit that the cited references neither teach nor suggest the presently claimed invention of claim 1. As claim 12 depends from claim 1, as do new claims 18-25, the cited references do not teach or suggest these claims. Withdrawal of this rejection is respectfully requested.

d. Lyman in view of Mogard

Claims 1 and 12 were rejected under 35 U.S.C. § 103(a) over Lyman in view of Mogard. Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

The arguments made above with respect to Lyman and Mogard individually, and Dickinson in combination with Mogard, apply here in equal force to show that Applicants' invention as set forth in claim 1 is not obvious over the combination of Lyman and Mogard. As claim 12 depends from claim 1, as do new claims 18-25, the cited references do not teach or suggest these claims. Accordingly, withdrawal of this rejection is respectfully requested.

e. Dickinson in view of Wilding

Claims 1 and 14-15 were rejected under 35 U.S.C. § 103(a) over Dickinson in view of Wilding et al., U.S. Patent No. 5,587,128 ("Wilding"). Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

The nonobviousness of Applicants' invention over the disclosure of Dickinson is discussed in detail above. The arguments apply here with equal force to show that Applicants' invention is not obvious over Dickinson.

Wilding discloses a hybridization chamber having a height or depth that is within Applicants' range as claimed in claims 14 and 15. The combination of Dickinson and Wilding does not result in anything close to Applicants' invention. The result would be an apparatus having a gasket situated in a groove of either the base plate or the lid, such that the outside lip of the groove acts as a spacer, and a spacer height of 300 microns. This would in turn result in an array hybridization chamber having a height, when defined by urging the base plate and lid, of 300 microns. This is not Applicants' invention, for the reasons discussed above in relation to Dickinson.

The additional element of a specified height, even though it is within Applicants' range of height specified in claims 14 and 15, does not remedy the differences between Dickinson and Applicants' invention as discussed above.

Accordingly, based on the foregoing differences, Applicants respectfully submit that the cited references neither teach nor suggest the presently claimed invention of claim 1. As claims 14-15 depend from claim 1, as do new claims 18-25, the cited references do not teach or suggest these claims. Withdrawal of this rejection is respectfully requested.

f. Lyman in view of Wilding

Claims 1 and 14-15 were rejected under 35 U.S.C. § 103(a) over Lyman in view of Wilding. Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse the rejection.

The arguments made above with respect to Lyman and Wilding individually, and Dickinson in combination with Wilding, apply here in equal force to show that Applicants' invention is not obvious over the combination of Lyman and Wilding. Accordingly, Applicants respectfully submit that the cited references neither teach nor suggest the presently claimed invention of claim 1. As claims 14-15 depend from claim 1, as do new claims 18-25, the cited references do not teach or suggest these claims. Withdrawal of this rejection is respectfully requested.

4. Summary

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903
(612) 332-5300

Date: August 9, 2007

Lori P. Sarageno
Reg. No. 52,862

LPS:kf